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SCIENCE NEWS LETTER

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HORTICULTURE

Citrus Fruit Threatened

"Quick decline", caused by a virus, is endangering orange and grapefruit trees. Virus has not been isolated and the carrier has not been identified.

➤ AN INVISIBLE virus is threatening the entire American citrus fruit industry. The disease of orange and grapefruit trees is called "quick decline."

Latest step in combatting it is the discovery that quick decline is due to a microscopically invisible, filter-passing virus. Dr. H. S. Fawcett and Dr. J. M. Wallace of the University of California's Citrus Experiment Station made the discovery. Belief that it might be due to mineral lacks in the soil had previously been disproven by experiments of their colleague, Dr. H. D. Chapman.

Drs. Fawcett and Wallace demonstrated the virus nature of quick decline by grafting shoots of diseased trees into branches of healthy ones, which subsequently became sick. Control grafts with healthy shoots into healthy trees produced no ill effects.

The virus itself has not yet been isolated, nor has the insect or other carrier that transfers it from tree to tree been found. These are next steps in the battle.

Outstanding symptom of quick decline, which occurs only in sweet orange and grapefruit grafted onto sour orange stocks, is a failure of the carbohydrate foods formed in the leaves to pass the graft junction into the roots. They are thus starved to death and presently decay; then the whole tree withers and dies.

Although Drs. Fawcett and Wallace do not mention it in their report, this fatal course of the disease is apparently identical with that observed in tristeza, highly fatal citrus-tree malady that is wiping out thousands of orange trees in Brazil and neighboring countries in South America, and is known also from South Africa and the Netherlands Indies.

This would suggest that quick decline and tristeza are one and the same disease, except for one thing: the spread of quick decline through an orchard is much slower than that of tristeza. Either they are not identical (though possibly related), or the virus is carried by a slower insect or other carrier, or some unknown factor in climate, soil, etc., works to retard the spread in California orchards.

Thus far quick decline has not been found in citrus orchards in Florida, Texas, Arizona or other states.

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ASTRONOMY

Solar Eclipse Expeditions

➤ AT LEAST nine expeditions are being planned by astronomers and amateurs anxious to observe the total solar eclipse on May 20 from points in South America, according to information received by Prof. Charles H. Smiley of Brown University from astronomer friends in Brazil, Argentina, England and New Zealand.

Three parties will observe from Argentina, but none of these will represent foreign groups. Six expeditions will have headquarters in Brazil, where totality will last longer. Two of these will be from the United States, one from England, one from New Zealand and two representing Brazil.

An expedition, under the direction of Dr. Enrique Gavioli, from the Argentine National Observatory at Cordoba, is expected to make its headquarters about fifty miles north of Cordoba. A group from the La Plata Observatory, probably headed by Dr. C. V. Cesco, will locate near Corrientes, in northern Argentina near the border of Paraguay, or at Tostado, southeast of Corrientes. This party may divide its work between the two sites. A group representing the Asociacion Argentina "Amigos de la Astronomia," under the leadership of Dr. B. H. Dawson, will observe the eclipse at Itati, also in northern Argentina near Paraguay.

In Brazil three sites are likely to be occupied. These include Araxa, about 300 miles northwest of Rio de Janeiro, by the Brown University-Skyscrapers Expedition, Lassance and Bocaiuva, about 400 miles north of Rio, by the National Geographic Society-Army Air Forces Expedition.

There will be in Brazil an expedition headed by Dr. C. B. Michie, representing the New Zealand Astronomical Society, and one led by Dr. J. A. Carroll from London, England. It is understood that two parties of Brazilian astronomers plan to observe the eclipse from points near Araxa and Lassance.

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ENGINEERING

Panama Soil to be Tested In View of Canal Proposals

➤ ROCK AND SOIL from the Panama Isthmus will be tested in Harvard laboratories within the next few months, the university revealed.

The tests will be to determine their ability to withstand earthquake shocks, volcanic activities, and the effects of vibrations set up by heavy explosions such as might result from bombs.

The testing is in connection with proposals to increase canal facilities between the Atlantic and the Pacific, now approaching the maximum of the present canal's capacity. Three such proposals are receiving serious consideration.

These include the addition of a third set of locks to the present canal; converting the present waterway to a sea-level route; and the digging of a new canal in another part of the Isthmus. The decision is a matter that rests with Congress; the objective is a waterway across the isthmus that will accommodate the largest commercial and naval ships, as well as the thousands of smaller craft that use the shortcut from ocean to ocean, and also to assure passageway from the Atlantic to the Pacific in spite of wartime enemy attacks.

The Panama canal, 50 miles in length, was opened Aug. 15, 1914, but was not officially completed until 1921. The cost to then was over $525,000,000. The surface of Gatun Lake, through which the canal runs, is normally 85 feet above sea level. The locks, by means of which ships are raised to the higher levels of the canal, were originally constructed about 1,000 feet long and 110 feet wide at their bottoms. The depth of the canal is 41 feet or over.

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That *hunting* is a favorite American sport is shown by the fact that nearly 10,000,000 persons paid $20,000,000 for hunting licenses during 1946.

VETERINARY MEDICINE

Livestock Disease Menace

Foot-and-mouth disease, that has touched a million Mexican farm animals, can threaten the livestock industries in the United States by crossing the border.

➤ A MILLION Mexican farm animals, more or less, are either sick of foot-and-mouth disease or have been dangerously exposed to it. About two-thirds of them are cattle; the rest are swine, sheep and goats. This situation not only endangers our neighbor nation's milk and meat supplies; it constitutes a real menace to the whole American livestock industry, even though the point of outbreak nearest to our boundary is still a good 300 miles away. It does not take long for an unchecked plague to travel that far.

For three weeks recently Dr. M. S. Shahan, U. S. Department of Agriculture veterinarian, was in the field with three American and several Mexican colleagues, conducting as complete a survey as possible in the nine Mexican states where the disease exists. They form a zone extending from Veracruz to Mexico City and somewhat beyond, with the plague-stricken areas extending principally along routes where animals are driven or transported.

Separated from this zone by a 150-mile gap is the state of Aguascaliente, where a single outbreak occurred in one village, mainly among work-oxen. This was the point of outbreak nearest American territory. All these animals, they were informed, have now been killed and deeply buried.

In the main zone of infection, little has been done thus far. Mexican agricultural authorities realize the seriousness of the situation, and they know that the one sure means of wiping out the disease is to kill all sick and exposed animals, bury them deeply, and disinfect the premises very thoroughly with strong lye water. But before you can kill off a farmer's livestock you have to compensate him for the loss; also, the disinfecting job isn't cheap. And the Mexicans have no money.

That is what makes the situation our problem as well as theirs. If the outbreak had occurred in this country both federal and state governments could have gone into action at once, with plenty of men and means. There has been an excellent cooperative spirit between the Mexican and American agricultural authorities; but of course there are a lot of things that have to be decided at higher official levels in both governments. The Secretary of Agriculture has asked Congress for legislation to enable us to cooperate with any American country in combating livestock plagues.

One of the things that the Department of Agriculture has wanted for a long time is a good, strong, tight fence along the very thinly patrolled U. S.-Mexican boundary. It would have to be high enough to prevent deer and antelope from jumping it, stoutly anchored enough to prevent peccaries or wild pigs from burrowing under it, as well as strong and tight enough to stop stray cattle. Stopping interchange of animal populations along the border would do much to prevent the transmission not only of foot-and-mouth disease but of other infections that can be carried by wild as well as domestic animals.

Efforts have been made to find out how this outbreak of foot-and-mouth disease got started in the first place. Strong circumstantial evidence points to the landing of some 300 zebu bulls at Veracruz in 1946. The animals had been brought for breeding purposes from Brazil, where foot-and-mouth disease is known to exist.

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DISEASED COW—This animal is infected with foot-and-mouth disease, hazard to the livestock industry.

ECONOMICS

U. S. Gets Few Machines, Bids for Nazi Plant

➤ THE UNITED STATES has been allotted "a few machines" from a German optical works and is bidding for a Nazi aluminum foil plant, but the dispute over economic unification of Germany has produced a virtual stalemate in reparations from the great industrial areas of the western occupation zones, State Department sources said.

The machines are from the famous optics plant of Hensoldt and Sons, at Herborn in the American occupation zone. First U. S. reparations granted by the Inter-Allied Reparations Agency, the machines will go to U. S. Navy arsenals. Most of the Hensoldt plant, which produced binoculars famed throughout the world, was allocated to The Netherlands.

The U. S. now has a bid in for the Tschelden aluminum foil plant in the French occupation zone. The bid, based on the demand in this country and the status of American equipment, will be passed on by the Inter-Allied group, which may give all or a part of the plant to the U. S. or allocate the plant entirely to other countries.

Meanwhile, the flow of German military production tools from the huge industrial reservoir of the western occupation zones has dropped to a small trickle. The State Department indicated that the U. S. delegation to the Moscow conference of foreign ministers next month will give high priority to the question holding up distribution of some of the world's most famous scientific and industrial equipment—economic unification of Germany.

Russia wants reparations to proceed before the economic differences are ironed out, but the western powers seek unification of the German economy before parcelling out the approximately 2,000 industrial plants in the western zones earmarked for reparations.

First full picture of the reparations situation in western Germany is expected in the annual report of the Secretary General of the Inter-Allied Reparations Agency. The report will be made later this month.

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ASTRONOMY

Data for Polar Explorers

➤ BY "SHOOTING the sun" for the sake of science in the Antarctic, H. C. Peterson, physicist on the Ronne Antarctic Expedition, plans to bring home new solar refraction data that promised to save the lives of lost polar explorers of the future.

Polar regions are the worst places in the world in which to get lost, according to Prof. Charles H. Smiley of Brown University. People stranded in the Arctic and Antarctic are likely to strike out in the wrong direction.

The sun circles close to the horizon a large portion of the time and present refraction tables, based on data gathered 75 to 100 years ago, are none too accurate when sextant readings must be taken with the sun low in the sky.

At sunrise and sunset the sun appears to be flattened to an oval. This illusion is caused by atmospheric refraction, bending of light rays as they enter the earth's atmosphere, and is most pronounced near the horizon. When complete data on the change in the apparent vertical diameter of the sun, caused by the change in the angle of refraction, have been gathered from pole to pole, new refraction tables are to be worked out at Brown University for the use of those navigating in polar regions.

Through the cooperation of the Bureau of Research of the U. S. Navy, the Finn Ronne Antarctic Expedition, now enroute to the south polar area, has agreed to carry out a program of observations from latitude 22 degrees south into the Antarctic. This will provide valuable data on atmospheric refraction at low altitudes.

Prof. Smiley and his party will cover the latitudes between Providence and Rio de Janeiro when he leads an expedition to Brazil in May to see the total solar eclipse. It is hoped that within the year the observations can be extended north into the Arctic, covering all latitudes.

The data gathered will help scientists choose among the various theories of atmospheric refraction. All theories agree for high altitudes. Research on low altitudes will tell which theory of refraction is best.

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SOCIOLOGY

Know Delinquents by Play

➤ PARENTS of earlier generations brought their children up in accordance with the old adage about Satan finding mischief for idle hands to do. Some justification for their idea appeared in a report by Dr. Dale B. Harris of the University of Minnesota to the American Association for the Advancement of Science.

The play interests of delinquent boys in their early teens was the subject of his study. They differ significantly from those of non-delinquents, he found. Generally they are "mischief and idle activities such as could arise from lack of supervision, late hours and carrying on activities permitted older persons, such as frequenting taverns, pool rooms and the like."

The delinquent or potentially delinquent boy can be located in terms of his play interests, Dr. Harris found, but varieties of delinquencies or types of delinquent play interests could not be differentiated except in a very broad sense.

Two patterns of play interests especially characteristic of delinquents appeared. One consisted of different gambling activities. The other, more juvenile in nature, was comprised of three activities: hitching rides on street vehicles, catching rides on freight trains, and stealing fruit and melons.

The association of these play interests with delinquency was not marked enough to be statistically significant, however.

"Probably," Dr. Harris concluded, "delinquency is associated with the sample accumulation of these idle, unconstructive interests. The patterns of activities have meaning only in relations to the wishes and needs of individual boys and not in terms of the outward appearance of the activities themselves."

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CHEMISTRY

New Chlorine Preparation Uses Two Old Processes

➤ CHLORINE, an indispensable element in chemical manufacturing processes all the way from bleaching cloth to making synthetic rubber, goes back to the thermal method of production in the process on which Alfred M. Thomsen of San Francisco has obtained patent 2,415,152. His process resembles two that were in use before present-day electrolytic methods superseded them, but avoids the difficulties that made the old methods obsolete. Critical step is the use of fragments of firebrick superficially impregnated with frequently renewed layers of cupric chloride as catalysts in the oxidation of hydrochloric acid to chlorine and water. Spent gases from the heating process involved in the impregnation are used to raise the temperatures of the gases involved in the process.

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RADIO

Station in Lipstick Tube

Broadcasts can now be made from the word's tiniest radio station, that will fit into a lipstick tube. Radio the size of calling card to make debut.

➤ WORLD'S SMALLEST radio station, complete with a tube and circuit which will fit in an empty lipstick container, broadcast for the first time recently in Columbus, Ohio.

A complete radio on a plastic card the size of a calling card will make its debut in New York next month to complete the vest-pocket radio transmitting and receiving unit.

Dr. Cledo Brunetti, an electrical engineer at the National Bureau of Standards in Washington, demonstrated his tiny but complete broadcasting station to the Columbus section of the Institute of Radio Engineers.

He predicts that the printed wire process which makes his midget radios possible can reduce the cost of wiring radios 30% to 60%. Wiring cost, he adds, is a big item in the price you pay for a radio.

Vest pocket radios even may come with the vest of the future. Dr. Brunetti says that complete radio circuits can be printed on cloth.

The inch-long broadcasting transmitter and the "calling card" radio have been developed from the wartime proximity fuze which had a complete radio sending and receiving station to explode shells accurately near enemy planes. This was made possible with printed wire.

Instead of the complicated copper wires in your home radio set, the proximity fuze and Dr. Brunetti's radios use lines of "silver ink," a solution of fine silver or silver oxide, painted over a stencil to form a two-dimensional circuit. The carbon resistors are painted in over another stencil with a carbon solution to complete the circuit.

To complete a radio set, tiny tubes are soldered onto the printed circuits. Dr. Brunetti's lipstick container-size radio station has the circuits painted on a small tube.Tiny batteries from a hearing aid and a small microphone round out the complete equipment for the world's smallest radio station.

In addition to the inch-long broadcasting unit, Dr. Brunetti demonstrated two other transmitters. His "larger" transmitters have the midget tubes mounted on small plates. One of the plates with the printed wire circuit is about the size of half dollar.

The first broadcasts were made with special permission from the Federal Communications Commission, the agency which may be faced with the problem of regulating broadcasts from pocket-size radio stations in the near future.

Dr. Brunetti was one of the pioneers in the work on printed wire for the proximity fuze. The process is now produced commercially by the Centralab division of Globe-Union, Inc., Milwaukee, Wis.

First large-scale peacetime use of printed wire may come for hearing aids. A hearing aid, with miniature tubes and ordinary batteries, has been produced with a circuit one inch high and two and one-half inches long. Dr. Brunetti expects these units to be on the market in a few months.

Wires without wires for the proximity fuze were produced with stencils on ceramic plates. Research at the National Bureau of Standards since the war ended has revealed new methods of applying the process on many different materials.

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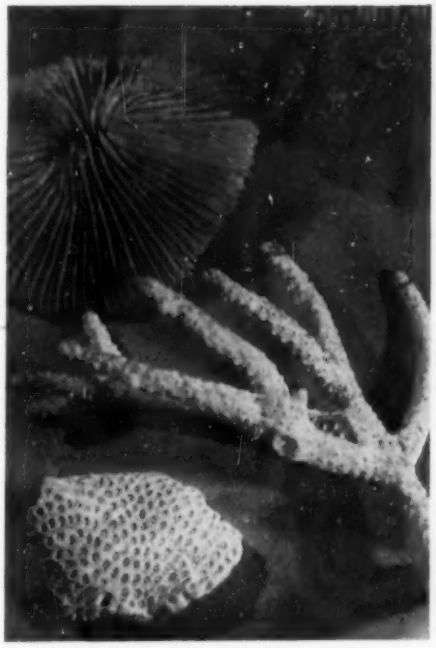

PHOTOGRAPHY AID—Pictures help toward understanding of science, is the thesis advanced by Miss Robin Cooley, 17, of the Albany (N. Y.) Academy for Girls, Science Talent Search winner. She enforces her point in her winning essay with this picture of several forms of coral.

PLANT PHYSIOLOGY

Chlorophyll Retains Light

➤ ONE OF THE mysteries of photosynthesis has been solved by University of California chemists. They have shown how chlorophyll holds on to light energy long enough for it to be stored in plants as sugar, starches, and other substances.

Photosynthesis is the process whereby nature maintains all life on earth. In this process carbon dioxide and water are combined, with the help of chlorophyll, the green pigment in plants, into the energy substances such as sugar.

The Berkeley scientists have shown that chlorophyll has a phosphorescent quality. Earlier they had demonstrated that phosphorescing molecules are in a magnetic state. The shining of a light on these molecules literally boosts them up to this state, and they retain the light until they lose their magnetism.

This fundamental principle, one of the last scientific contributions of the late Prof. G. N. Lewis, was demonstrated by suspending a fluorescein-containing glass between the poles of an electro-magnet. A strong light thrown on half of the glass made it swing quickly toward one of the poles, showing the fluorescein molecules had been magnetized.

Dr. Melvin Calvin, associate professor of chemistry on the Berkeley campus, who had been collaborating with Prof. Lewis, carried the work over into photosynthesis. He found that the phosphorescent state in chlorophyll lasts for about a tenth of a second, about 10,000,000 times as long as the non-phosphorescent state retains light. Thus there is plenty of time for the conversion of this light energy into the many organic energy substances found in plants.

Dr. Michael Kasha, research fellow in chemistry, and Gus Dorouch, graduate student, assisted Dr. Calvin.

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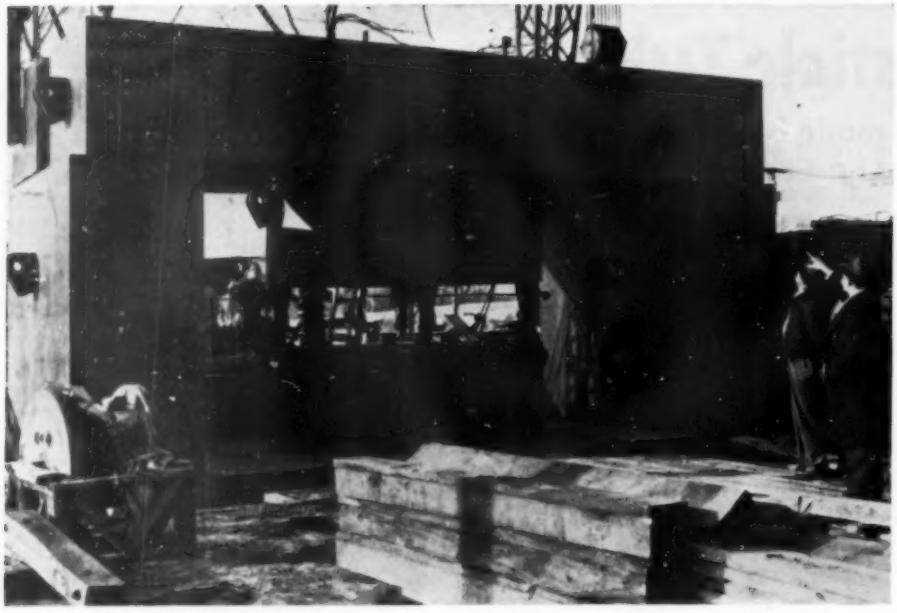

CYCLOTRON MAGNET—Giant steel blocks, forged by the United States Steel Corp., are assembled to form the magnet for the University of Rochester's cyclotron, second largest cyclotron in existence. Finished, the four forgings making the base and top weigh 157 tons each, the side columns 125 tons each, and the round pole pieces 90 tons each.

RADIO

Long Distance Radio Aided

➤ LONG DISTANCE radio communications, always plagued by changing conditions in a temperamental ionosphere, may look to some improvement from a new development in the technique of bouncing radio waves off that ionized layer of the atmosphere.

Dr. M. G. Morgan, working in the Navy Electronics Research Laboratory at the University of California, has found that by rotating a transmitting antenna to a certain position he can obtain a clearer signal reflected from the ionosphere.

He explained that radio waves traveling within the ionosphere are split into two distinct components by the action of the earth's magnetic field. One of these waves is generally stronger than the other, and both register on a receiver, often resulting in garbling.

Further, the polarizations of these two signals rotate in opposite directions, and there are random changes in the strength of the two signals caused by variations in the ionosphere. These factors contribute to fading.

By rotating the antenna to a most favorable position, Dr. Morgan has found it should be possible to obtain one very strong reflected signal and one very weak one, rather than two of nearly equal volume.

The most favorable position of the antenna would vary with the conditions prevailing in the ionosphere, but it should be possible to determine this by test signals.

Thus it may be possible to build a rotating antenna which can be adjusted to prevailing conditions, Dr. Morgan says, achieving a uniformly strong signal and reducing fading and garbling which now handicap long distance radio transmission.

Dr. Morgan's finding is a result of research now being done in the Berkeley laboratory under contract with the Navy's Bureau of Ships to improve Naval communications.

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CHEMISTRY

Lignin Used to Purify Beet, Cane-Sugar Juices

➤ USE OF THAT Cinderella of the plant-products world, lignin, as a means for purifying beet and sugar-cane juices before concentration was developed by W. D. Nelson of Reserve, La., for patent 2,415,439. Lignin, dissolved out of bagasse or other wastes with alkali, is added to the crude juice, then coagulated with lime and heat, trapping trash and impurities.

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PHYSICS

Seismographs Cannot Detect Secret Atom Bomb Tests

➤ HOPES that seismographs could be used as robot detectives of unauthorized atom bomb tests have been dashed as soon as raised. Dr. B. Gutenberg of the California Institute of Technology, whose study of the seismic wave started by "Baker" explosion at Bikini last summer is cited in news dispatches as basis for such expectations, stated flatly in response to a telegraphic inquiry from Science Service, "No such use of seismographs is possible."

It is true that the far-off explosion registered itself on instruments as far east as Tucson, Ariz.; but the record is an excceedingly minute "squiggle", like hundreds of others in slightly wavy lines traced by the instruments during intervals between "earthshaker" quakes, and would have been overlooked if the exact time and distance of the explosion had not been known in advance. It is like reading a "whodunit" backwards.

A smaller-scale, shorter-range use of seismic methods for detection of military explosions was proposed early in the recent war, when ordnance men thought it might be possible to locate the positions of heavy guns by using seismograms. Seismologists, however, pointed out that all the enemy would have to do would be to fire a number of pieces in a ragged salvo, and the record would be so blurred that interpretation would be impossible.

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CHEMISTRY

Copper-Nicotine Compound Joins Fight Against Insects

➤ AN OIL-SOLUBLE compound of copper and nicotine, suitable for dissolving in hydrocarbons to enhance their insecticidal properties, is the chemical invention of Claude R. Smith of the Eastern Regional Research Laboratory, U. S. Department of Agriculture. Rights in his patent, No. 2,414,213, have been assigned, royalty-free, to the government.

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MEDICINE

Bacitracin Fights Germs

Made from germs, bacitracin clears up abscesses in a short time. It can be applied by injection or as a salve and is being prepared on pilot-plant scale.

➤ A NEW germ-fighting chemical from germs has saved 62 out of 100 patients from the surgeon's knife.

The new chemical, named bacitracin, was discovered by Dr. Frank L. Meleney and Miss Balbina Johnson of Columbia University's College of Physicians and Surgeons and the Presbyterian Hospital.

Particularly striking was the result in a dangerous abscess of the face below the lower lid near the outer side of the left eye. A red, hard area pointed in a triangular fashion toward the inner angle of the eye on the nose side. Bacitracin solution was injected into the abscess. Twenty-four hours later the pointing triangle had receded and the danger of germs invading the boy's skull and brain had passed.

Bacitracin scored another success in a patient with a deep abscess of the cheek. The abscess measured about an inch and a half in diameter. Pus was sucked out of the abscess with a needle and bacitracin injected on two successive days. On the fourth day the swelling was all gone and there was no need to cut the abscess.

Infected fingers, boils, carbuncles, styes and ulcers are among the other conditions in which bacitracin made it unnecessary for the surgeon to cut and lance, or, if surgery was needed, helped speed healing.

Both patients and doctor were often surprised by the speed and completeness of healing in some of the cases.

In the 12 cases in which results were not good, the infection had lasted long enough before treatment for a breakdown of tissue or other physiological disturbance, or the wound had become contaminated with other germs resistant to bacitracin.

Bacitracin was originally obtained from a germ from a badly infected wound in a patient who had broken the bone on the inside of his leg below his knee. Dr. Meleney and Miss Johnson found the material while looking for evidences of germ-fighting-germ action in badly infected civilian accidental wounds.

It is now being produced on a pilot-plant scale for Dr. Meleney's use on patients by the Ben Venue Laboratories at Bedford, Ohio.

So far, Dr. Meleney has used it locally, injecting it into an abscess or boil, or applying it in the form of a salve. Pilot-plant operations have now yielded the material in a form suitable for injection into muscles, as penicillin is now given, John T. Goorley, of the Ben Venue Laboratories, reported at a conference on antibiotics sponsored by the U. S. Public Service in Washington.

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ELECTRONICS

Electronic Tool Preserves, Sterilizes Fresh, Raw Food

➤ AN ELECTRONIC tool for sterilizing and preserving foods in their "fresh, raw state," is announced by Drs. Arno Brasch and Wolfgang Huber, of the research laboratories of Electronized Chemicals Corporation, New York, in *Science* (Jan. 31).

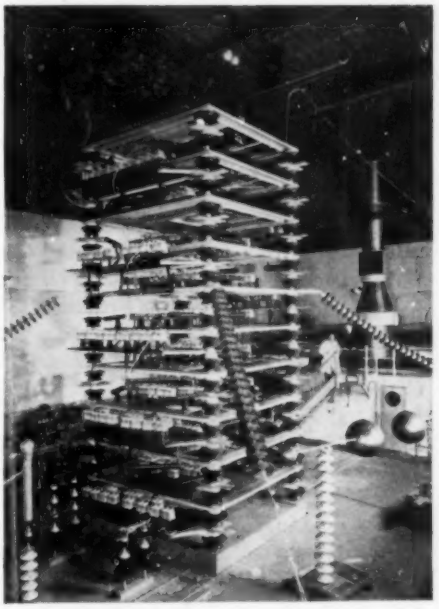
The Capacitron is the name of the device. It releases electrons during a time period of about one millionth of a second with an electronic intensity of about 30,000 to 50,000 amperes.

Medicinals, such as penicillin powder, novocaine solution and diphtheria antitoxin, and other therapeutic materials such as whole blood and plasma, were sterilized as well as foods. No change in potency or any harmful effects on the blood were observed.

Ground raw beef and fluid milk were among the foods made completely sterile, or germ-free, though they had previously been contaminated with germs.

Meat, fish, eggs, vegetables and fruits were preserved without any "deep-going" changes in taste, odor and appearance by impulse doses three to 15 times the sterilizing dose. This larger dose achieved its preserving effect by checking enzyme action, the scientists state.

"An irradiated steak," they report, "was preserved unchanged for all practical purposes after storage in the incubator at 37.5 degrees Centigrade (between 98 and 99 degrees Fahrenheit) for 12 days."



FOOD STERILIZING—The Capacitron, developed in the laboratories of the Electronized Chemicals Corporation, sterilizes and preserves food and drugs.

If the Capacitron lives up to its promise, it will be a very important development, in the opinion of other scientists who have read the first report of it.

While operating costs of the device might seem prohibitive, detailed estimates, the scientists state, show that such expenditures will not materially increase the final price of the treated product if the output of the Capacitron is adapted to the desired purpose.

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MINERALOGY

Rare-Earth Mineral Is Named Nuevite

➤ A NEW MINERAL, nuevite, has been christened by its discoverer, Dr. Joseph Murdoch of the University of California at Los Angeles. It is named for the town of Nuevo, Riverside County, Calif. Dr. Murdoch found the first specimen in a silica quarry near there.

Nuevite is described as a heavy, black, shiny material, containing the three rare elements yttrium, titanium and tantalum, together with iron. Although classified as a rare-earth mineral, its spectral analysis shows no uranium. Because of its scarcity, commercial uses are unlikely.

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MEDICINE

Jewett Nail Aids Healing Of Broken Hip Bones

➤ ELDERLY PEOPLE who suffer broken hips nowadays have a much better chance of recovering, thanks to a device known as the Jewett nail. Good results with this latest appliance were reported by Drs. Mather Cleveland, David M. Bosworth and Frederick R. Thompson of New York City at the meeting of the American Academy of Orthopaedic Surgeons.

Mortality, formerly about 40%, has been reduced to about 12%, and the broken bone has been prevented from healing crookedly so the person has difficulty walking.

The Jewett nail is a combination of a three-flanged nail and bone plate all in one piece. It is screwed firmly to the shattered bone after it has been put back into normal position by an operation.

No traction is necessary after the operation. The elderly patients can turn in bed and so do not develop bed sores. Very few developed severe mental disease, though previously about 11% had to be transferred to mental institutions because of the severe psychotic state which developed.

The time the patient must stay in the hospital has been cut to almost half and the cost to the patient has been equally reduced. When these broken hips in elderly patients were treated by traction, before development of the Jewett nail, they had to remain in bed as long as 14 weeks.

Broken hips, or fractures of the neck of the femur (thigh bone), are traditionally the fractures of old people but they are also often sustained by persons in the prime of life.

Science News Letter, February 22, 1947

MINERALOGY

Golden Fleece of Jason Probably Was Sheepskin

➤ A SCIENTIST has come up with an explanation of the mythical Golden Fleece of Jason.

Prof. Arthur F. Taggart of the Columbia University School of Mines, writing in the *American Scientist* (Jan.), explains, "The Golden Fleece that Jason stole was probably the sheepskins used to line the bottoms of gold sluices."

He adds that the ancient sheepskin process is related to the modern flotation method, used to concentrate more than 100,000,000 tons of ore per year in the United States.

In the flotation process, small particles of different minerals are separated in an aqueous suspension, called a pulp. A froth of one mineral floats on top of the other and is overflowed or skimmed off. "Without the process," declares Prof. Taggart, "the copper, lead and zinc supplies of the country would have been more than critically short in the last war, and many less common metals and minerals would have been unavailable."

Heart of the process is the selective production of a hydrocarbon-like film on the particles in the pulp which are to be floated. The sheepskins, which were probably the basis of the ancient myth about the Golden Fleece, owed at least a part of their effectiveness as gold collectors to the natural grease they contained, Prof. Taggart points out.

Science News Letter, February 22, 1947

CHEMISTRY

Helium and Spectrometer Detect Leakage of Gases

➤ TINY LEAKAGES in systems built to hold gases are easily detected by the use of helium and a spectrometer, the American Chemical Society was told by Prof. T. I. Taylor of Columbia University at a meeting at Hunter College.

The equipment to be tested is filled with helium gas, the non-combustible American gas used in balloons and dirigibles, he said. The mass spectrometer is placed at joints which are suspected of leaking. If helium is escaping, its spectrum lines show up in the instrument. The helium used in this manner is called a tracer, and the method employed is called tracer technique.

Tracer technique is now widely coming into use in every branch of chemistry in which chemical reactions are followed in detail as they occur among isotopes. These are specially prepared atoms of peculiar weights. Recently relatively simple mass spectrometers have been developed especially for identifying isotopes rapidly and accurately.

Citing the importance of the mass spectrometer in petroleum chemistry, where it is used for rapid analysis of mixtures of many chemically similar compounds, Prof. Taylor declared that the instrument can be applied to the problems of almost any chemical process involving gases or substances that can be gasified.

Science News Letter, February 22, 1947

IN SCIEN

CHEMISTRY

Wax-Like Sticks Remove Stains From Clothes

➤ STAINS on clothes, from tea, coffee, iodine, ink, grass and other substances, are easily removed by means of two new wax-like chemical sticks recently patented. They contain a type of alcohol.

The process is simple. The fabric is laid on a clean under-cloth and sponged; then what is called the acidic stick is daubed on until no more stain appears on the under-cloth. After again rinsing the spot, the second stick, a reducing stick, is applied and the spot disappears.

The chemicals used in the wax-like sticks are based on what is known technically as polyethylene glycols. Glycol is an alcohol, but not the ordinary type. Chemically it is between ethyl alcohol and glycerine, which is also an alcohol. The acidic stick contains an acid salt of oxalic acid and tri-ethanolamine, a product made by treating ethylene with ammonia. The reducing stick contains powdered sodium bisulfite or other reducing material.

A new tarnish remover, a household article to clean silver, gold, copper, brass and other metals, is also based on the same glycols. Both stain remover and tarnish remover are developments of Carbide and Carbon Chemicals Corporation of New York.

Science News Letter, February 22, 1947

AGRICULTURE

Member of Aspirin Family Kills Tobacco Blue Mold

➤ CHEMICAL COUSINS of aspirin have proven among the best means for control of tobacco blue mold tried out by the U. S. Department of Agriculture scientists. Blue mold is a fungus disease that attacks tobacco seedlings before they reach the transplanting stage, and often destroys enormous numbers of them.

The chemicals found effective against the fungus are compounds of salicylic acid; bismuth subsalicylate, used as either a spray or a dust, gave especially good results. Aspirin is the proprietary name for another compound of the same acid—acetyl salicylic acid.

Science News Letter, February 22, 1947

NE FIELDS

PLANT PHYSIOLOGY

Penicillin Can't Cure Trees of Blight Diseases

➤ PENICILLIN is great stuff when used on many human diseases, including some pneumonias, but it doesn't cure sick trees.

When University of California agriculturists found that the mold chemical destroyed pear and walnut blights in test-tube experiments, they were hopeful.

Injections of commercial penicillin into blighted Bartlett pear trees and English walnut trees were made by pathologist B. A. Rudolph. The experiment failed. Evidently the sap in the trees diluted the drug too much.

Science News Letter, February 22, 1947

INVENTION

Mass-Production Ice Cubes Come Out of New Machine

➤ ICE CUBES on a mass-production basis, turned out fast enough to satisfy even the biggest and thirstiest convention crowd, are the comforting promise of a new machine on which U. S. patent 2,414,264 has been granted to Willis B. Kirkpatrick of Scarsdale, N. Y.

The cubes are frozen in compartments in a set of double-walled trays, revolving on a horizontal hollow shaft through which the freezing brine is circulated to the hollow space between the double walls. The set of trays revolves within a horizontal drum containing the raw water, dipping it up until they are filled. The trays are then covered with flat lids, to insure that the ice cubes will be turned out clear and unbulged.

The brine is kept at optimum freezing temperature until the cubes are well solidified. Then the flat lids are removed, the warmer brine is circulated around the compartments, loosening the cubes and permitting them to fall out through a chute as the machine continues to revolve. Then more water is turned into the drum, the freezing trays are refilled and lidded, freezing brine flows through the circulating system, and the process is repeated.

Science News Letter, February 22, 1947

PHYSICS

Hydrogen May Be Used In Rocket Propulsion

➤ ATOM-POWERED rockets of the future may use liquid hydrogen to translate the radiant energy of uranium into terms of propelling push, Rear Adm. William S. Parsons, Navy Director of Atomic Defense, suggested at the Founders' Day luncheon of the University of Pennsylvania. The hydrogen will not be burned as fuel, but merely will be converted back into gas, which will be heated to incandescence and expelled through the nozzles at tremendous velocity. Outside, it will of course unite with atmospheric oxygen, giving the rocket a flaming tail; but this will not add anything to the propelling power.

This mode of rocket propulsion, first suggested by Dr. Luis W. Alvarez, seems possible because of one physical law of rocket propulsion: that the lightest atoms have the highest momentum at any given temperature. Hydrogen, being the lightest of elements, would be best to use for theoretical reasons. Fortunately, practical reasons back it up: hydrogen is plentiful, cheap, easily liquefied and easily handled.

Outstanding difficulty about using atom-powered rockets, as Adm. Parsons sees it, is the terrific expense in terms of hard-to-get uranium, whenever a rocket goes astray and is not recovered.

Science News Letter, February 22, 1947

ZOOLOGY

Thirteen Frogs in Red Union Suits From Colombia

➤ THIRTEEN FROGS in red union suits, even redder than the old-fashioned ones that most of us have been wishing we had, have just arrived at Washington from the South American republic of Colombia and are comfortably established in the well-warmed reptile house of the National Zoological Park, where cold waves never come.

They were brought to Washington by Maurice K. Brady, a Washington businessman who had occasion to be in Colombia recently, and turned over to Director William M. Mann of the Zoo, who declares that they are "the reddest things I've ever seen alive." The red body color is emphasized by black spots. Although the frogs are only an inch long from nose-tip to where the tail might be if a frog had one, their vivid coloring makes them look bigger.

They live in most unfroglike fashion, Mr. Brady reports, hopping about on the open forest floor in the high jungle, where the remote treetops are so densely interwoven that no underbrush can grow on the ground. Despite their conspicuousness, they hop around perfectly freely, seeming to fear no enemy.

This may be due to the deadly poison they carry under their skins, Mr. Brady suggests; their blazing hue may be a case of what Darwin termed warning coloration.

Indians use this toxin to poison their arrow-heads and blow-gun darts. They put the frogs in the hot sun, or even on heated stones, until the luckless batrachians literally sweat poison through their skins. This the Indians carefully scrape off and save for their munitions business. Mr. Brady states that he saw a dog hit by such a poisoned blow-gun dart; the animal died very quickly.

One species of these land-going frogs, states Dr. Mann, carries its tadpoles from one pool to another. They cling to the parent's body during such migrations like a lot of bright-hued little flags.

Science News Letter, February 22, 1947

CHEMISTRY

New Nitrogen Fertilizer Is Insoluble Resin

➤ WAR-CAUSED famine in Europe is focusing attention on problems of production of food, and of fertilizer that helps make food. Timely interest thus attaches to a new kind of nitrogen-containing fertilizer, covered by U. S. patent 2,415,705.

One difficulty with all nitrogen fertilizers now in use is their high solubility, which permits rain or irrigation water to leach them out of the soil very rapidly. A water-insoluble fertilizer, in which the nitrogen is still available to plant roots, has long been a great desideratum among agronomists.

This problem has been met by L. V. Rohner of Syracuse and A. P. Wood of Geddes, N. Y., who make a water-insoluble resin by compounding urea and formaldehyde, adding ammonium nitrate (another high-nitrogen compound) during the process to bring the mixture to a desired degree of acidity. After washing and drying, the resulting resin is finely ground and bagged for shipment. Patent rights have been assigned to the Solvay Process Company.

Science News Letter, February 22, 1947

ASTRONOMY

With March Comes Spring

The sun, creeping northwards, will reach its half-way point on March 21. Early in the evening, Virgo, the virgin, and Bootes, the bear driver, are seen in the east.

By JAMES STOKLEY

➤ TO THOSE of us who live in the northern hemisphere, March is always welcome because it marks the beginning of spring. Ever since December the sun has been creeping northwards among the stars and now it reaches the half-way point. Each year this position, called the vernal equinox, is reached at a slightly different time. In 1947 it comes on March 21, at 6:13 a.m., EST. Of course, as the sun moves to the north in this part of the world, it gets higher in the sky, but this puts it lower for the southern hemisphere. Hence, instead of marking the beginning of spring, March 21, in South America, Australia, South Africa, etc, is the beginning of autumn.

Like other times of year, the evening skies now have their characteristic aspect. Orion, Gemini, Taurus, Canis Major and Minor and the other constellations that were so prominent in the evening skies of winter, though still visible, are seen well to the west and set considerably earlier than they did in January. On the other hand, Virgo, the virgin, and Bootes, the bear driver, are seen in the east early in the evening. The big dipper, in Ursa Major, the great bear, is swinging high into the northeast.

Shown on Maps

These are all shown on the accompanying maps, which depict the heavens as at 10 p.m., your own standard time, about March 1 and an hour earlier at the middle of the month.

Still the brightest star shown is Sirius, the dog star, in Canis Major, in the south and slightly to the west. Higher and farther west is Orion, the warrior, with bright Betelgeuse and Rigel. Directly west is Taurus, the bull, with ruddy Aldebaran. Next to Taurus, to the right, is Auriga, the charioteer, with first magnitude Capella.

Above Orion we see the twins, Gemini, with Castor and Pollux. The latter is of the first magnitude, and the former a little fainter. Below Gemini is Canis Minor, the lesser dog, with Procyon.

In the southeast is Virgo, the virgin, with Spica near the horizon, and above it Leo, the lion, in which Regulus shines, at the end of the handle of a subgroup called the Sickle.

Cancer, the Crab

Between the sickle and Gemini is the constellation of Cancer, the crab, which is not ordinarily very conspicuous but is made so in March by the presence of the planet Saturn, brighter than any of the stars with the exception of Sirius. Saturn is almost in line with Castor and Pollux, which helps to identify it.

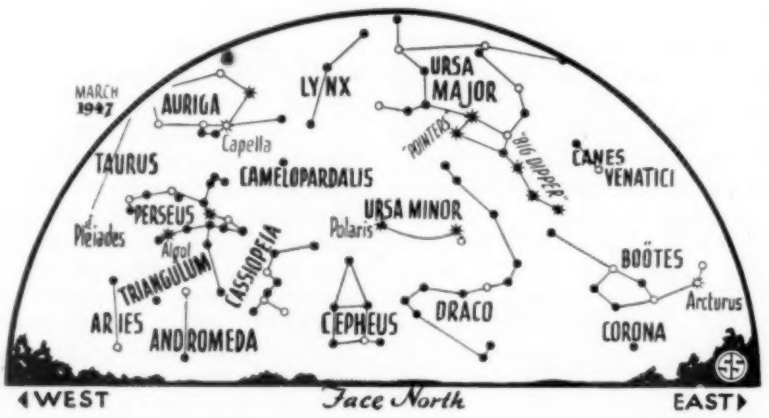
Low in the northeast Bootes, already mentioned, is seen, and it contains another star of the first magnitude, Arcturus by name. In the northwest is seen Perseus, the champion, in which can be found the famous variable star Algol, which fades in brilliance every two days, 21 hours, as a darker companion passes in front and partially eclipses it.

Another planet besides Saturn can be seen if we wait a little later in the night. Jupiter, in Libra, the scales, rises about midnight, and is even more brilliant than Sirius. Venus, still brighter, in Capricornus, the sea-goat, is visible low in the southeast at sunrise. Mercury and Mars are not to be seen this month, because they are so nearly in line with the sun.

Early in March, on the evening of the third, the constellation of Cancer, which is now made prominent by the presence of the planet Saturn, will be even more so because the moon will also be in it. At 9:15 p.m., EST, on that evening, the moon passes to the south of the planet. It will be interesting to watch the part of the sky through which the moon moves. On March 6, it is full, and then will stand in the constellation of Virgo. Soon after this it disappears from the evening sky as it goes through the phase of last quarter, and back to new, which it reaches on the 22nd. Then it is so nearly in line with the sun that it cannot be seen, but a couple of days later, on the 24th, it will be seen as a narrow crescent low in the west. Then it will be in the constellation of Pisces, the fishes. On March 29 it reaches first quarter when it will be in Gemini. Early in the morning of March 31 it is back in Cancer, and passes Saturn again.

Six Constellations

Each month as the moon moves around the sky, ever changing in phase, it passes through the same constellations. Six of these are shown on our maps—they are Aries, the ram, Taurus, Gemini, Cancer, Leo and Virgo. It will be noticed that the only planet now visible, Saturn, is in one of these. They are constellations of the zodiac, the band through which the sun, moon and planets always move. Through the middle of this band runs the ecliptic, an imaginary line which represents the place where the plane of the earth's orbit would intersect the sky if it were an actual sphere, as it appears to be. The sun always is on this line, the moon and



planets are always close to it, and the zodiac is a band seven degrees either side.

Usually it is stated that there are 12 constellations in the zodiac. In addition to the six shown on the maps, there are Libra, the scales (in which Jupiter is seen when it rises about midnight); Scorpio, the scorpion; Sagittarius, the archer; Capricornus, the sea-goat; Aquarius, the water carrier and Pisces, the fishes. One way of remembering these is from a verse written by Dr. Isaac Watts, famous writer of hymns such as "Oh God, our help in ages past." He wrote a book on astronomy, first published in 1725, containing this rhyme, which is usually misquoted:

"The Ram, the Bull, the heavenly Twins,
And next the Crab, the Lion shines,
The Virgin, and the Scales.
The Scorpion, Archer, and Sea-Goat,
The Man that holds the Water-Pot,
And Fish with glittering tails."

Actually, however, there are more than these 12 groups through which the moon and planets travel. For example, on March 14, when the moon is at last quarter, it will stand in the constellation of Ophiuchus, the serpent bearer. Not considered a zodiacal group, this figure really comprises more of that band than does the scorpion, which is next to it. Also parts of Cetus, the whale; Auriga, the charioteer; Orion; Sextans, the sextant and Corvus, the crow, come into the zodiac.

Celestial Time Table for March

March.	EST	
3	3:00 p.m.	Moon nearest, 227,800 miles
	9:15 p.m.	Moon passes Saturn
6	10:15 p.m.	Full moon
8	5:00 p.m.	Mercury toward sun
12	9:56 a.m.	Moon passes Jupiter
14	1:28 p.m.	Moon in last quarter
15	12:01 a.m.	Algol at minimum
	12:00 noon	Moon farthest, 251,000 miles
17	8:50 p.m.	Algol at minimum
18	8:08 p.m.	Moon passes Venus
20	5:39 p.m.	Algol at minimum
21	6:13 a.m.	Sun crosses equator, Spring commences
22	11:34 a.m.	New moon
29	8:00 a.m.	Moon nearest, 230,000 miles
	11:15 a.m.	Moon in first quarter
30	7:00 p.m.	Neptune nearest, 2,721,000,000 miles
31	2:16 a.m.	Moon passes Saturn

Subtract one hour for CST, two hours for MST, and three for PST.

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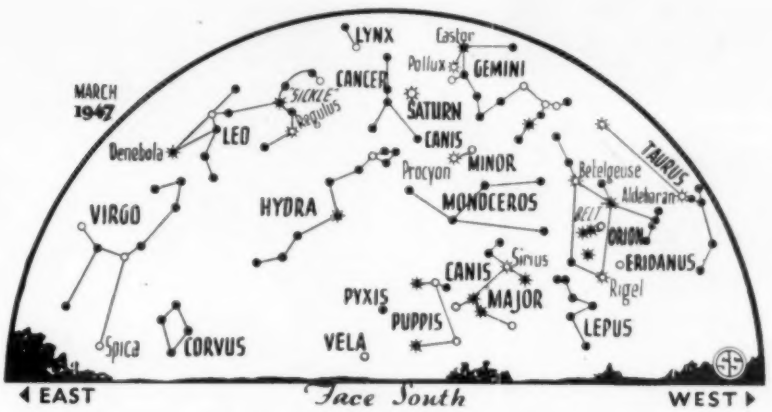

☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

AERONAUTICS

Plastic Radar Dome Has Fiber Glass Base

➤ A NEW PLASTIC substance with great impact resistance, stronger than any other yet made and lighter than aluminum, has been developed by the Cornell Aeronautical Laboratory to house radar and increase its efficiency in high-speed aircraft.

A radar dome made of this new fiber-glass reinforced plastic, developed by the laboratory's wood and plastic section under the direction of Norman E. Wahl, will be installed in the nose of an AT-126 plane around new radar equipment.

Mr. Wahl said the new plastic has special electrical properties which cut absorption of radar waves to only 3%, increasing radar efficiency in flight more than 10%. With earlier plastic radar domes as much as 18% of radar waves was lost.

This new and as yet unnamed plastic is 20% to 30% stronger than aluminum and is 4% lighter, Mr. Wahl said. It has 30 times the impact strength of other plastics and is slightly more resilient.

The new material, he explained, is a significant step in the development of a plastic suitable for aircraft construction. The biggest drawback now is its price but he believes it will be widely used to build both planes and automobiles when costs are lowered through mass production.

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America, which in early days was a *tea-drinking nation,* can now be said to be a coffee-drinking country; England, on the other hand, switched from coffee, and its famed coffee houses, to tea about three centuries ago.

INVENTION

Throttle Valve Keeps Car From Stalling on Red Light

➤ HAVE YOU EVER STALLED your car, on trying to start after waiting through a red light with your not-fully-warmed-up engine idling? If you have ever had this embarrassing experience (and who hasn't?) you will appreciate a new gadget invented by L. E. Perrine of Detroit, which he calls a thermostatic throttle stop.

The stop on your throttle, which lets just enough fuel through to idle a warm engine, isn't set right for a cold one. To remedy this, the inventor adds to the carburetor a cam-controlled throttle valve, the position of the cam being determined by the expansion or contraction of a heat-responsive bimetallic strip actuated by the heat of the engine. It is adjusted to let more fuel through when the engine has not had time to warm up properly.

Rights in the patent, No. 2,415,529, have been assigned to the General Motors Corporation.

Science News Letter, February 22, 1947

Oil from flaxseed, with melted amber added, was used by ancient Egyptians as a varnish.

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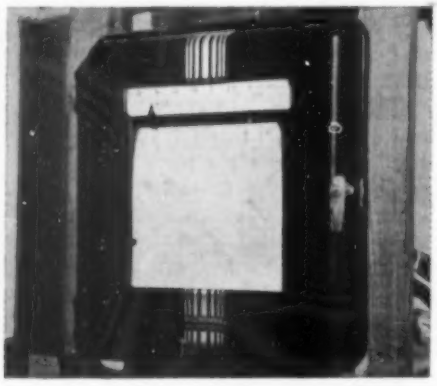
Do You Know?

By forcing certain fungicides under pressure into wood, *lumber* may be protected for many years from decay.

One-dollar federal *"duck stamps"*, which all waterfowl hunters over 16 are required to have in addition to state hunting licenses, yielded the U. S. government over $1,725,000 in 1946.

The real reason why *oysters* should not be eaten during the May-to-September season is that this is their spawning time, and summer oyster-fishing endangers future supplies.

Cheap *oxygen*, a matter of much concern in the chemical and other industries, was made in Germany by the fractional distillation of liquid air at extremely low temperatures.



Micromax Saves Observer's Time By Recording Solar Radiation

The Micromax Recorder shown above is one of two which are helping Smithsonian scientists measure solar radiation faster and more easily for the Army's tent research at Camp Lee, Va. It records radiation falling on an Eppley Pyrheliometer; the other micromax, not shown, charts fabric temperatures beneath various glass filters. These instruments save nearly all of the time which would be needed for hand plotting of the same data.

We'll be glad to send further information on request.

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LAB LIGHTNING—Students in the College of Engineering at Duke University make laboratory lightning, replete with claps of thunder. The student operating the one-half-million-volt generator is protected from stray charges by the wire screen.

GENERAL SCIENCE

Army, Navy "Poles Apart"

See Front Cover

➤ WHILE RIVAL plans for unification of our armed forces are still under hot debate in various quarters, huge forces from the Army and Navy are literally poles apart.

The Navy's big winter maneuver is the so-called Byrd Expedition, a full-fledged task force now opening up new lands in the Antarctic reaches of the Southern polar continent.

Meanwhile, the Army is studying military operations in cold weather with three task forces sent out in the opposite direction from Admiral Byrd's Little America. Army Task Force "Frigid" is battling the cold at Fairbanks, Alaska; Task Force "Williwaw" is in the Aleutian Islands; and a third cold-weather party, Task Force "Frost," is operating out of Camp McCoy, Wis. The cover of this SCIENCE NEWS LETTER shows the snow-capped mountains of the wet-cold Williwaw area in a U. S. Army Signal Corps photograph.

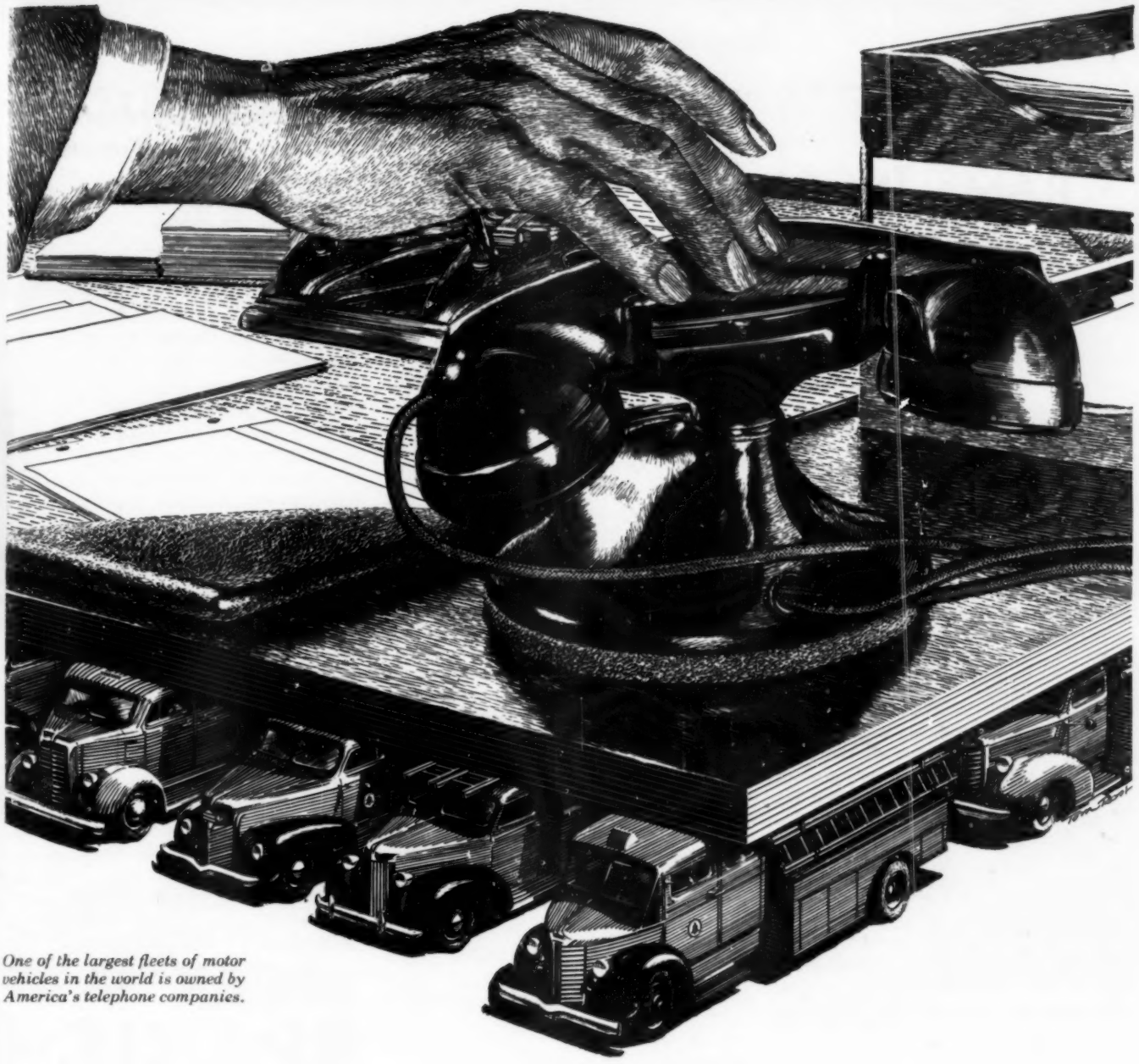
Actually, the Army and Navy are not so far apart. Both services are conducting determined tests to see how men and equipment stand up under cold. The Army has representatives with the Navy Force in the Antarctic, and Navy ships last year made at least two unprecedented thrusts in the cold northern waters of the Atlantic.

Unified or apart, the Army and Navy are making up for lost time—lost in winning World War II. There were operations in the snow for Army troops at Ardennes and in the Aleutians, and Navy ships and sailors braved some cold weather in the north Atlantic. But most of World War II was fought in temperate or even tropical climates.

Both services are acutely aware of the need for experience and equipment for operating in cold weather. Armed forces in an atomic age must be prepared to operate in any climate, military leaders believe.

Most sensational aspect of the cold weather operations is the discovery of new, unknown lands in the Antarctic by the Navy Task Force. Yet the Navy's primary purpose is that of the Army in Alaska and elsewhere in the North: training men and testing equipment.

These task forces, in some of the coldest weather on the face of the earth, are helping give the U. S. an all-weather Army and Navy.



One of the largest fleets of motor vehicles in the world is owned by America's telephone companies.

Your telephone call rides on gasoline

YOU'RE used to thinking of a telephone call as a matter of wires and cables and switchboards. But did you ever consider how many cars, trucks, and trailers go into each call? Day and night, in all kinds of weather, gasoline motor vehicles are helping to maintain telephone lines, carrying repair crews, hauling telephone poles and other equipment.

Thus, each improvement in gasoline transportation has helped to improve telephone service—a service which today is the best in the world, in spite of current shortage conditions.

Improvements in gasoline during the past twenty years have been frequent. As refiners developed new refining processes and made greater use of Ethyl brand antiknock compound, the octane rating of gasoline has steadily climbed. Better gasoline, in turn, has made possible better engines—more efficient and economical gasoline transportation.

This trend to improved fuels and better engines has by no means reached its end. As current "reconversion" difficulties are overcome, petroleum refiners look forward to gasoline better than anything ever marketed in the past. Automotive engineers look forward to producing engines to utilize the future gasoline. And we of Ethyl are already cooperating with both the automotive and petroleum industries in solving the technical problems of advanced gasoline power. Ethyl Corporation, Chrysler Building, New York 17, N. Y.

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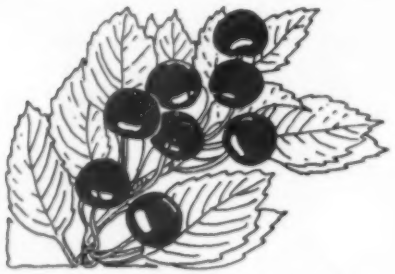
AGRICULTURE

NATURE RAMBLINGS by Frank Thone



"Farmer George"

➤ WASHINGTON is honored as soldier, statesman, engineer, city planner. Washington thought of himself primarily as a farmer. When he was at Mount Vernon he was happy; during all the many years he had to be away from that beautiful riverside estate his chief longing was to get back home and busy himself with management of the land and improvement of its production. "Farmer George" was a nickname his enemies tossed at him, but for Washington there was no sting in the epithet: farmer he was, and proud of it. His very name, George, is the Greek word that means a farmer.

Yet most of us, if we were suddenly to be asked what Washington did on his farm, or for American farming in general, would be stumped. We know one unauthentic legend about a destructive adventure in an orchard at an early period of his life. But few of us ever get to hear of the many trees he had a hand in setting out, or of the fields whose fertility he strove to improve by crop rotation and better cultivation methods.

To anyone who goes there with land use uppermost in his mind, a visit to Mount Vernon is a revelation. It is a gentleman's house, but Washington was by no means what we think of when we use the somewhat derogatory phrase, "gentleman farmer." Farming is a business, a business that Washington knew. He made money at it, as his carefully-kept account-books still show. He aimed to improve himself in it: the bookcases still contain agricultural reference books and bound volumes of such farm journals as were available in his day. He was constantly improving the home ground; it is not unlikely that some of the old box bushes and at least two Lebanon cedars at Mount Vernon were planted by his farm-hands under his personal direction.

There is one homely anecdote (not of Parson Weems' telling!) that shows how Washington was able to do a real public service and at the same time make it pay for itself. Finding that the town of Alexandria (metropolis of the Potomac shore in his day) was ill supplied with fresh vegetables, he devoted a few acres at Mount Vernon to raising garden truck, and once a week sent to town a cart loaded with the produce. Farmer George was a practical soul.

Science News Letter, February 22, 1947

YOUR
HAIR
AND ITS CARE

By Oscar L. Levin, M.D.
and Howard T. Behrman, M.D.

NEW, REVISED, EXPANDED EDITION—JUST OUT!
If you want healthy hair, lovely hair, then you need the expert advice in this book.

Two medical specialists have here pooled their knowledge to give you in plain language the up-to-date scientific facts now available about hair. They tell you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, common and uncommon, as:

Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene, etc., etc.

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TEXTILES

Electricity Scattered Southern Cotton Mills

➤ COTTON MILLS in the South are more widely scattered than earlier in their history, due to the availability of electricity for power and of electrically operated air-conditioners that insure proper humidity, the American Institute of Engineers was told by J. D. McConnell of the Proximity Manufacturing Company, Greensboro, N. C.

The record of change and growth in the textile industry, particularly in the South, is closely tied to electric power. The first cotton mills were located on water power sites, both to be within mechanical transmission distance and in humidity conditions necessary in the proper processing of this material.

Science News Letter, February 22, 1947

PUBLIC HEALTH

Americans to Get More Sanitary Food in Future

➤ CLEANER, purer food for Americans in future is foreseen by U. S. Food and Drug Commissioner Paul B. Dunbar.

Food factories and warehouses will be more sanitary, he predicts, as a result of organized industry's efforts to bar insects, rats, mice and other sources of dirt and disease germs from their plants.

"The courts are not disposed to countenance the shipment of filthy food, insanitary factories or practices, or failure to protect sound food through storage negligence," he declared in his annual report to the President and Congress.

"The year 1946 saw the largest number of substantial penalties levied in the history of Federal food law enforcement. Six jail sentences and 32 fines of from $1,000 to $4,000 were imposed and 24 injunctions were granted to restrain further traffic in unfit food, either permanently or temporarily while corrections of objectionable conditions were in progress. Nine other injunctions are awaiting court hearing."

Actions to remove filthy and decomposed foods from the market involved nearly 70% of all food seizures in 1946.

Science News Letter, February 22, 1947

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Books of the Week

ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR—J. A. Krug—*U. S. Govt. Printing Office,* 448 p., paper, $1. Problems of natural resource management and development.

BUILDING CODE REQUIREMENTS FOR NEW DWELLING CONSTRUCTION; Building Materials and Structures Report BMS107—National Bureau of Standards—*U. S. Govt. Printing Office,* 43 p. paper, 20 cents.

CASEY JONES CYCLOPEDIA OF AVIATION TERMS—Arr. by Henry Lionel Williams—*McGraw-Hill,* 246 p., illus., $5. Prepared under the supervision of Aviation Research Associates.

DOMESTIC GEESE AND DUCKS—Paul Ives—*Orange Judd,* 372 p., illus., $3.50. Discussion of problems connected with raising geese and ducks for student and practical breeder.

ELECTRICAL ENGINEERING; Essential Theory and Typical Applications—Fred H. Pumphrey—*Prentice-Hall,* 369 p., illus., $5.35. A text for students specializing in other fields.

ELECTRONS, ATOMS, MOLECULES—Albert Cushing Crehore—*Christopher,* 133 p., illus., $3.75. New conception of forms of atoms in their steady states supported by calculations.

FLOWERS—William Alphonso Murrill—*Published by the author,* 120 p., illus., $3. A simple guide to wild flower recognition.

HUMAN DESTINY—Lecomte du Nouy—*Longmans,* 289 p., $3.50. A scientist presents a new interpretation of evolution, and expresses a startling theory of man's place in the universe.

THE JOURNAL OF GLACIOLOGY, Vol. I, No. 1, January 1947—Gerald Seligman, ed.—*British Glaciological Society,* price to non-members 7s6d per issue.

MAMMALS OF EASTERN ASIA—G. H. H. Tate—*Macmillan,* 366 p., illus., $4. An introduction to animals in the East still strangers to the West.

PLASTICS AND YOU—Stephen Bass—*Eastwood-Steli,* 190 p., illus., $2.75. The story of a new fast-growing industry presented in a simple readable way.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS—C. Lipson, ed.—*Addison-Wesley,* Vol. IV, No. 1, 128 p., illus., $6.

REPORT OF THE COMMITTEE ON MARINE ECOLOGY AS RELATED TO PALEONTOLOGY—Div. Geology and Geography—*National Research Council,* 101 p., paper, 50 cents. The sixth report of this committee.

STUDIES OF COMPULSIVE DRINKERS: Part I. Case Histories—Herman Wortis and Leonard R. Sillman; Part II. Psychological Test Results—Florence Halpern—*Hillhouse Press,* 90 p., paper, $1. Distributed by the Quarterly Journal of Studies on Alcohol.

TANKER MANUAL—John F. Summerill—*Cornell Maritime Press,* 150 p., illus., $2.75. A basic training manual for beginners and a refresher for experienced tankermen.

WHAT DO YOU KNOW ABOUT BLINDNESS?—Herbert Yahres—*Public Affairs Committee,* Pamphlet No. 124, 32 p., paper, 10 cents. How to treat the blind like human beings.

YOUR CRAFT BOOK—Louis V. Newkirk and LaVada Zutter—*Int. Textbook,* 212 p., illus., $5. A treasure-house of creative work projects for children, requiring only simple materials and tools.

Science News Letter, February 22, 1947

PHYSICS

Snow for Weather Control

► AIRPLANE ICING conditions over large areas, and severe hail storm activity such as prevail in parts of the Midwest, may some day be curtailed or eliminated by creating artificial snowstorms, Dr. Irving Langmuir of General Electric Laboratories told the American Physical Society.

"Undoubtedly, some climatic or weather changes would ensue from vast area seeding" with microscopic nuclei, he said, "but we are in too early a stage to speculate on that." The nuclei might be introduced by generators on the ground into the atmosphere and remain there until they produce snow.

Dr. Langmuir reported on successful experiments made in GE laboratories under his direction by Vincent J. Schaefer and Dr. Bernard Vonnegut. They have found about a dozen substances to serve as nuclei to produce snow in laboratory cold-chambers, including dry ice previously reported, of which silver iodide is the best.

Natural snowflakes contain microscopic foreign particles as nuclei. In the laboratory experiments moist air is introduced into a small commercial freezing unit and the artificial nuclei added. With dry ice, snow crystals begin to form in ten seconds and increase in size as more moisture is supplied.

Among the foreign materials, in addition to dry ice and silver iodide, successfully used in producing laboratory snow are lead iodide, iodoform, iodine crystals, apatite, nephelite, wurtzite, zincite, and certain cerium oxides.

Pointing out that a temperature of minus 31 degrees Fahrenheit is required for natural ice nuclei to form spontaneously, and that natural snowstorms often occur at temperatures higher than this, Dr. Langmuir said there is every reason to believe that nature often starts snowstorms with artificial nuclei.

He estimated that approximately 200 pounds of silver iodide might prove sufficient to seed the entire atmosphere of the United States at the rate of 100,000 nuclei per cubic foot. "About one pound of silver iodide per hour of additional seeding probably would be required to maintain this condition," he said.

Science News Letter, February 22, 1947

One important method of making *chlorine* is as a co-product in the manufacture of caustic soda from salt by the electrolytic process.

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❁ *POWER-DRIVEN burners, in a self-contained unit on a two-wheel carrier, can shoot a flame from six inches to 15 feet long, the latter with a temperature of 2,000 degrees Fahrenheit. Designed for use by farmers, highway engineers and railroads, it can be used also in factory plants.*

Science News Letter, February 22, 1947

❁ *SMALL switching locomotive, developed in Germany, gives extra adhesion to the rails by jacks located at both ends. The end of the locomotive is driven under the end of a car to be moved, and the jack raised until the engine is carrying a considerable portion of the weight of the car.*

Science News Letter, February 22, 1947

❁ *CLOSE-UP attachment, for amateur movie-makers using eight- or 16-millimeter film, is a unit with one auxiliary lens and a compensating viewfinder. Easily fastened to the camera lens, the device gives accurate framing and needle-sharp focussing at distances as short as six inches.*

Science News Letter, February 22, 1947

❁ *LIMB-LOPPER for trimming trees has a hooked upper end to pass over the branch, and a cutting edge operated by compressed air when a push-button valve is opened. The 10-foot aluminum tool weighs less than nine pounds and will cut a limb nearly an inch thick.*

Science News Letter, February 22, 1947

❁ *MODERN MOTOR for shop or home, one-quarter horsepower capacity, is about one-third the size and weight of its 43-year-old ancestor. The enclosed housing of the new motor, as can be seen from the picture, protects the rotary parts from dust and grit.*

Science News Letter, February 22, 1947

❁ *HUMAN BRAINS and other specimens for use in physiology classes may be kept for two years in a transparent plastic wrapping, through which they are easily studied. The specimen, removed from a formaldehyde solution, is sealed within the covering; a plastic ruler beneath protects the tissue from the sealing iron.*

Science News Letter, February 22, 1947

❁ *MOTION PICTURE camera, now electrically driven, enables tourists and others to use 16-millimeter film without having to wind up a spring. Complete with battery, the unit weighs less than six pounds. Its special lightweight battery will run at least 20 magazines of film.*

Science News Letter, February 22, 1947

❁ *WALKING FRAME for orthopedic patients is a stall-like affair made of tubing with casters on its four legs. The invalid walker, within the frame, grasps the upper side pieces with his hands, and carries part of his weight by adjustable crutches extending from his armpits to the frame.*

Science News Letter, February 22, 1947

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